

## II. Amendments to the Claims

This listing of claims replaces without prejudice all prior versions and listings of claims in the application:

### Listing of Claims:

1. (Currently Amended) A fluid radiation treatment system having a direction of fluid flow, the system comprising:

a surface configured to be disposed substantially parallel to a direction of fluid flow; and

at least one two mixing elements disposed with respect to said surface such that each mixing element is configured to generate to create at least one fluid vortex adjacent to the a surface, downstream of the mixing element, at least one the mixing element having a first normal located at a centroid thereof, the two mixing elements being oppositely angled with respect to a plane passing through the longitudinal axis of the surface, and

the surface having a second normal which intersects the first normal at the centroid,

wherein the first normal, the second normal, and the direction of fluid flow are in a non-planar relationship.

2. (Currently Amended) The fluid radiation treatment system defined in claim 1, wherein each mixing element ~~the surface~~ comprises a leading edge.

3. (Currently Amended) The fluid radiation treatment system defined in claim 1, wherein each mixing element ~~the surface~~ comprises a trailing edge.

4. (Currently Amended) The fluid radiation treatment system defined in claim 1, wherein each mixing element ~~the surface~~ comprises a leading edge and a trailing edge.

5. (Withdrawn) The fluid radiation treatment system defined in claim 4, wherein the leading edge and trailing edge are substantially parallel.

6. (Withdrawn) The fluid radiation treatment system defined in claim 5, wherein the leading edge and the trailing edge are interconnected by a wing tip edge.

7. (Withdrawn) The fluid radiation treatment system defined in claim 6, wherein the wing tip edge comprises an edge substantially parallel to the direction of fluid flow.

8. (Currently Amended) The fluid radiation treatment system defined in claim 4, wherein the ~~a~~ leading edge and the ~~a~~ trailing edge are non-parallel.

9. (Withdrawn-Currently Amended) The fluid radiation treatment system defined in claim 8, wherein the one of the leading edge and the trailing edge is substantially perpendicular to the direction of fluid flow.

10. (Withdrawn-Currently Amended) The fluid radiation treatment system defined in claim 2, wherein the leading edge comprises a substantially curved edge.

11. (Currently Amended) The fluid radiation treatment system defined in claim 2, wherein the leading edge comprises a substantially straight edge.

12. (Withdrawn-Currently Amended) The fluid radiation treatment system defined in claim 3 ~~2~~, wherein trailing edge comprises a substantially curved edge.

13. (Withdrawn-Currently Amended) The fluid radiation treatment system in claim 3 2, wherein the trailing edge comprises a substantially straight edge.

14. (Currently Amended) The fluid radiation treatment system defined in claim 1, wherein the at least one mixing element comprises a planar surface.

15. (Withdrawn-Currently Amended) The fluid radiation treatment system defined in claim 1, wherein the at least one mixing element comprises a curved surface.

16. (Currently Amended) The fluid radiation treatment system defined in claim 1, wherein ~~an~~ the at least one mixing element comprises an apex portion.

17. (Withdrawn-Currently Amended) The fluid radiation treatment system defined in claim 16, wherein the apex portion is oriented to point substantially upstream with respect to the direction of fluid flow.

18. (Previously Presented) The fluid radiation treatment system defined in claim 16, wherein the apex portion is oriented to point substantially downstream with respect to the direction of fluid flow.

19. (Currently Amended) The fluid radiation treatment system defined in claim 1, wherein the two mixing elements comprise ~~comprising~~ a first mixing element and a second element.

20. (Previously Presented) The fluid radiation treatment system defined in claim 19, wherein the first mixing element and the second mixing element are substantially mirror images of one another.

21. (Withdrawn-Currently Amended) The fluid radiation treatment system defined in claim 19, wherein the first mixing element and the second mixing element are substantially non-mirror images of one another ~~about the first plane or the second plane.~~

22. (Previously Presented) The fluid radiation treatment system defined in claim 19, wherein the first mixing element comprises a first leading edge and a first trailing edge.

23. (Previously Presented) The fluid radiation treatment system defined in claim 19, wherein the second mixing element comprises a second leading edge and a second trailing edge.

24. (Previously Presented) The fluid radiation treatment system defined in claim 19, wherein the first mixing element comprises a first leading edge and a first trailing edge, and the second mixing element comprises a second leading edge and a second trailing edge.

25. (Previously Presented) The fluid radiation treatment system defined in claim 24, wherein at least one of the first leading edge and the second leading edge comprises a substantially straight edge.

26. (Previously Presented) The fluid radiation treatment system defined in claim 24, wherein both of the first leading edge and the second leading edge comprise a substantially straight edge.

27. (Withdrawn-Currently Amended) The fluid radiation treatment system defined in claim 24 ~~22~~, wherein at least one of the first leading edge and the second leading edge comprises a substantially curved edge.

28. (Withdrawn-Currently Amended) The fluid radiation treatment system defined in claim 24 ~~22~~, wherein both of the first leading edge and the second leading edge comprise a substantially curved edge.

29. (Withdrawn-Currently Amended) The fluid radiation treatment system defined in claim 24 22, wherein the first trailing edge and the second trailing edge are integral such that the first mixing element and the second mixing element are interconnected.

30. (Previously Presented) The fluid radiation treatment system defined in claim 24, wherein the first trailing edge and the second trailing edge are in spaced relation to define an opening between the first mixing element and the second mixing element.

31. (Withdrawn-Currently Amended) The fluid radiation treatment system defined in claim 24 22, wherein the first leading edge and the second leading edge are integral such that the first mixing element and the second mixing element are interconnected.

32. (Previously Presented) The fluid radiation treatment system defined in claim 19, wherein the first mixing element comprises a first apex portion.

33. (Previously Presented) The fluid radiation treatment system defined in claim 19, wherein the second mixing element comprises a second apex portion.

34. (Previously Presented) The fluid radiation treatment system defined in claim 19, wherein the first mixing element comprises a first apex portion and the second mixing element comprises a second apex portion.

35. (Previously Presented) The fluid radiation treatment system defined in claim 32, wherein the first apex portion is oriented substantially downstream with respect to the direction of fluid flow.

36. (Previously Presented) The fluid radiation treatment system defined in claim 32, wherein the second apex portion is oriented substantially downstream with respect to the direction of fluid flow.

37. (Currently Amended) The fluid radiation treatment system defined in claim 34 ~~32~~, wherein the first apex portion and the second apex portion are oriented substantially downstream with respect to the direction of fluid flow.

38. (Withdrawn) The fluid radiation treatment system defined in claim 32, wherein the first apex portion is oriented substantially upstream with respect to the direction of fluid flow.



39. (Withdrawn-Currently Amended) The fluid radiation treatment system defined in claim 33 ~~32~~, wherein the second apex portion is oriented substantially upstream with respect to the direction of fluid flow.

40. (Withdrawn-Currently Amended) The fluid radiation treatment system defined in claim 34 ~~32~~, wherein the first apex portion and the second apex portion are oriented substantially upstream with respect to the direction of fluid flow.

41. (Previously Presented) The fluid radiation treatment system defined in claim 1, wherein the at least one mixing element comprises a plane.

42. (Previously Presented) The fluid radiation treatment system defined in claim 1, wherein the at least one mixing element comprises a wedge.

43. (Currently Amended) A fluid radiation treatment system comprising:

~~at least one mixing element~~ two mixing elements  
configured for mixing a flow of fluid having a direction of fluid flow, ~~the at least one~~ each mixing element comprising a surface having a first normal which is:

(i) acutely angled with respect to a first plane

having a second normal substantially perpendicular to the direction of fluid flow; and

(ii) acutely angled with respect to a second plane parallel to the direction of fluid flow and orthogonal to the first plane

the two mixing elements being symmetrically disposed with respect to the second plane.

44. (Currently Amended) A fluid radiation treatment system comprising:

at least one mixing element for mixing a flow of fluid having a direction of fluid flow, the at least one mixing element comprising:

a surface having a normal which is acutely angled with respect to each of two planes which are orthogonal to one another, each plane intersecting on a line substantially parallel to the direction of fluid flow;.

the surface having a triangular shape consisting essentially of a leading edge, a trailing edge, and an apex at the intersection of the leading edge and the trailing edge.

45. (Currently Amended) ~~A fluid~~ An ultraviolet radiation water treatment system comprising:

at least one mixing element for mixing a flow of water fluid having a direction of fluid flow, the at least one mixing element comprising:

a surface having a normal which is acutely angled with respect to a first plane and a second plane which is orthogonal to the first plane, the first plane and the second plane intersecting on a line substantially parallel to the direction of fluid flow.

46. (Currently Amended) A fluid radiation treatment system having a direction of fluid flow, the system comprising:

first and second triangular-shaped mixing elements, the first triangular-shaped mixing element being disposed so as to form a first angle with respect to a direction of fluid flow, the second triangular-shaped mixing element being disposed so as to form a second, different angle with respect to the direction of fluid flow

~~at least one mixing element to create at least one vertex adjacent to a surface downstream of the mixing element, the mixing element oriented in a manner such that a single rotation around its nearest edge to the surface causes the mixing element to become parallel to a tangent to the surface at a point nearest to the mixing element, describing an axis of rotation that is oblique with respect to the direction of fluid flow.~~

47. (Currently Amended) A The fluid radiation treatment system defined in claim 1, further comprising a radiation source module coupled to said surface ~~including the fluid mixing device defined in claim 1.~~

Claims 48-51. (Cancelled)